LESSONS IN LETTERING

A SERIES OF PRACTICE BOOKS WITH TEXT, EXAMPLES AND EXERCISES

BY THOMAS E. FRENCH, M.E. AND WILLIAM D. TURNBULL, C.E.

BOOK 2

INCLINED SINGLE STROKE

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SCHOOL _____ NAME _____

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LESSONS IN LETTERING - BOOK 2

MATERIALS REQUIRED

(1) DRAWING PENCILS
F AND HH
(2) SANDPAPER PAD
(3) PENCIL ERASER
(4) ARTGUM
(5) PENHOLDER
(6) PENS
LEONARDT 516F, HUNT 512
GILLOTT 404, 303 AND 170
(7) DRAWING INK
(8) BOTTLE HOLDER
(9) PENWIPER

LESSONS IN LETTERING
FOR
STUDENTS AND DRAFTSMEN
A SERIES OF PRACTICE BOOKS WITH
TEXT EXAMPLES AND EXERCISES

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BOOK 1—VERTICAL SINGLE STROKE COMMERCIAL GOTHIC
BOOK 2—INCLINED SINGLE STROKE COMMERCIAL GOTHIC
OTHER BOOKS OF THE SERIES IN PREPARATION

INCLINED SINGLE STROKE COMMERCIAL GOTHIC

In the art of lettering there are various forms of alphabets used, each appropriate for some particular purpose or place. In the series "Lessons in Lettering" a single style is studied in each book. The style taken up in this Book 2 is the letter illustrated in the box at the head of this page.

Single stroke Commercial Gothic letters, in which the stems are made with a single freehand stroke of the pen, are very legible and capable of rapid execution. They are therefore appropriate for and are universally used on all kinds of commercial working drawings. Custom is about equally divided in the use of *vertical* single stroke, and *inclined* single stroke, a modification in which the letters are drawn to a uniform slope of about 68 degrees. Every engineer and draftsman must be able to make one or preferably both of these styles with skill and rapidity. To do this requires persistent and careful practice.

The progressive steps in learning to letter are:

First.—Learn the shapes and proportions of the individual letters and the order and direction of the strokes used in making them.

Second.—Learn to apply the rules for composition of the letters into words and combinations of words.

Third.—Develop skill and speed in coordinating the hand and eye in forming and spacing the letters and words.

The first five sheets of this copy-book are to be made in pencil only, studying the letters in their family groups, first the straight-line letters, then the curved letters, then the numerals. The sheets are arranged so that the first practice is done under the copy in line with the slope, making it easy to estimate the widths. This "slope repeat" practice is followed by "horizontal repeat" practice, in which the letters are made beside the copy.

Sheet 1. The Straight-line Letters.—Sharpen an F drawing pencil to a long conical point, cutting the wood away with a pen knife and rubbing the lead on a sandpaper pad. For these large letters the pencil should have a rather blunt, rounded point on the lead. Hold the pencil with the end of the forefinger about an inch from the point, keeping the muscles relaxed and comfortable.

First Exercise.—Each letter of the top line is to be drawn three times in succession in the spaces below it. Notice that each letter is contained in an inclined box of equal sides (rhombus), printed in colored ink. With this box as a guide to the eye learn the proportions of each individual letter as you draw it. Note that in the

first space below each letter the box is drawn for you, in the next space below one side only is given and in the last space both sides are to be drawn in a light full line (not a dotted line), before making the letter.

In drawing a straight line first mark points lightly for the extremities, then connect the points. Sketch the letters first very lightly, erasing and correcting where necessary, then brighten with a firmer stroke but not hard and wiry. Rotate the pencil occasionally so as not to wear the point off on one side. Begin the sheet by drawing a column of three **"I"s** in "slope repeat." Follow with three **"T"s** observing the sequence and direction of the strokes. Note that the **T** is equal to the box in width. **L, E, F, H, N, Z,** and **K** are less than the box in width. The "rule of stability" requires that **E, K, X,** and **Z** must be smaller at the top than at the bottom, and that **E, F,** and **H** have the cross-lines slightly above the middle. In **K,** stroke 2 meets stroke 1 two-fifths up from the bottom. Stroke 3 is at right angles to 2 and if extended would meet the top of stroke 1.

T, X, A, V, and **Y** fill the box. Note that the bridge of the **A** is about ⅓ up and that the junction of **Y** is exactly in the middle.

M and **W** are wider than the box. To make the **W** divide the upper line of the box into three equal parts and mark the length of one division to the right, outside the box. Carry the first division down to the bottom line and connect the points.

The success in making **A, M, V, W, X,** *and* **Y** *lies in getting the slanting strokes so that they make approximately equal angles with a slope guide line through their intersection.*

Second Exercise.—After practicing the letter **I** spaced as indicated, make three of each of the other letters to the right of the copy. The box for the first of these is given. Pencil lightly the boxes for the other two.

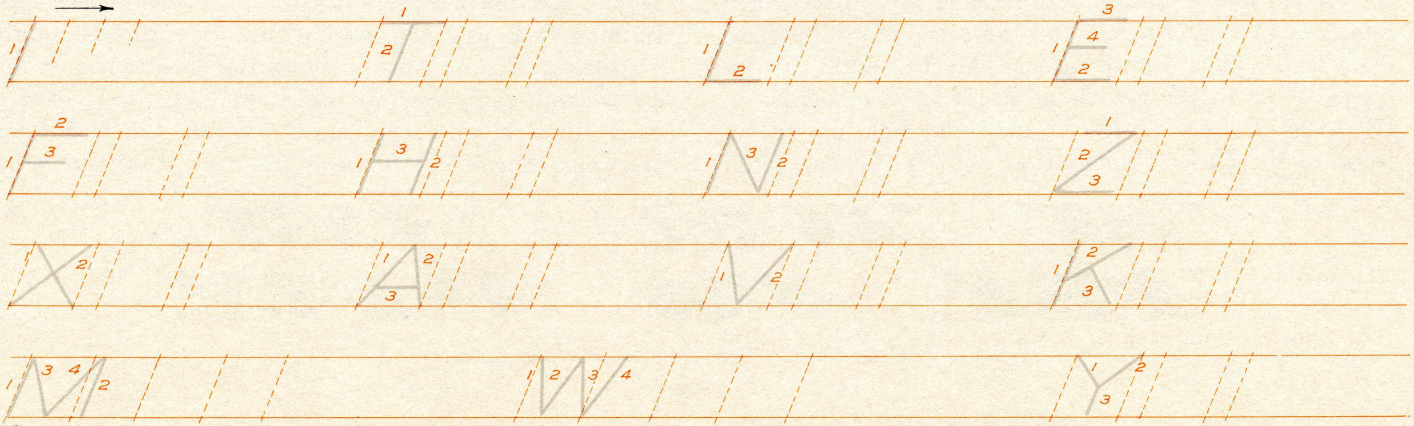
Memory Test.—After finishing sheet 1 go through the following mental exercise: Cover the page, and, using the line of letters printed below as an aid in remembering the group order, construct each letter mentally, closing the eyes to assist in concentration. Start with imaginary guide lines, and with an imaginary pencil make a box and go through all the steps of drawing each letter, marking the points and following the sequence and direction of strokes. Strive for a clear mental picture of the box with its letter, and do not leave this page until you can remember all the strokes and visualize any letter without hesitation.

I T L E F H N Z X A V M W K Y

FIRST EXERCISE (TOP TO BOTTOM)

SHEET 1

SECOND EXERCISE (LEFT TO RIGHT)



©

Sheet 2. Composition.—Letters composed into words are not placed at a uniform distance apart, but are so spaced that the word *appears* to be uniform. *This is done by making the areas of white space between the letters approximately equal.* In the first line of Fig. 1 the

FIG. 1.—LETTER SPACING, INCORRECT AND CORRECT.

letters are spaced with the clear distances between them equal. The word, however, is not uniform in effect, the last half appearing crowded. Note the improvement in the second line where the letters have been spaced with reference to their shapes, and the areas of white space equalized. Thus combinations like **LE** and **TT** are spaced close together while adjacent strokes such as in **IN** have the maximum distance. In spacing letters think of the backgrounds rather than the letters. Fig. 2 illustrates background shapes as they affect the eye. They may be thought of as flexible "packing" between the letters.

The words on this sheet contain all the letters of sheet 1 and are selected to give the greatest number of different combinations or shapes of backgrounds.

First Exercise. Slope Repeat.—Letter each word twice in succession under the copy. The colored slope lines are to aid you in spacing the letters. Notice carefully where they fall on the copy and make your work correspond.

Second Exercise. Slope Repeat.—The slope lines are purposely shifted.

Third Exercise. Horizontal Repeat.—Begin the words at the starting marks indicated. The slope lines have nothing to do with the spacing but are for direction only.

Memory Test.—After finishing the sheet cover it and go through each word mentally, making the strokes of each letter in order, spacing the letters and visualizing the appearance of the word as you draw it in your mind.

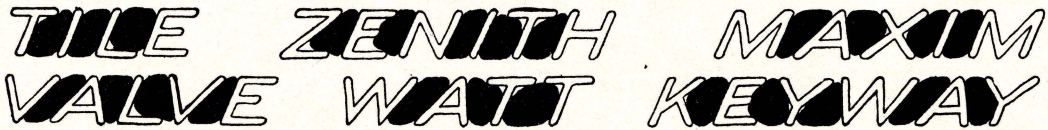


FIG. 2.—OPTICAL EFFECT OF BACKGROUND AREAS.

FIRST EXERCISE

SHEET 2

SECOND EXERCISE

THIRD EXERCISE

©

Sheet 3. The Curved Letters.—In place of the circle of the vertical alphabet, the "O" in this alphabet becomes an ellipse, which fills the rhombus box and is made with two strokes of varying curvature. Note carefully how stroke 1 starts with a long sweep and changes into sharper curvature at the lower end, while stroke 2 starts with a sharp curve and gradually flattens. It is this subtlety of curvature which gives to the inclined curved letters their beauty of form. Watch the copy closely as you draw the letters, noting that in every letter the curve is sharp in the upper right-hand and lower left-hand parts, and flattened in the other two.

First Exercise.—Pencil over the first two "O"s a number of times to get the "feel" and "swing" of the strokes, then draw a complete letter in each box in the line.

Second Exercise. Slope Repeat.—Practice the letters in columns sketching the boxes as in sheet 1, learning the sequence of strokes and observing closely the form of each letter and the proportionate width as compared to its box. Note carefully the starting and stopping points of the different strokes as indicated by the marks on the copy.

Remember the "*rule of stability,*" **B, E, K, S, X, Z** are *smaller at the top than at the bottom.*

Keep the mouth of the **C** wide open. In **G,** stroke 3 starts at the center of the letter, goes horizontally to the right, turns a sharp angle down the slope line, then near its end makes a distinct break in curving backward to meet stroke 1. In **P,** stroke 2 is slightly below the middle of stroke 1, in **R,** it is exactly in the middle, while in **B,** the corresponding stroke (3) is slightly above the middle. The **S** touches the left edge of the rhombus at two points.

Two forms of the ampersand (symbol for "and") are given, the first is preferred but some draftsmen use the second form, which is perhaps a trifle easier to make.

Third Exercise. Horizontal Repeat.—Draw three of each letter after the copy, sketching the boxes and observing carefully the letter proportions. Remember the *rule of varying curvature* which requires that the curves be sharp in the upper right- and lower left-hand and flatter in the lower right- and upper left-hand portions.

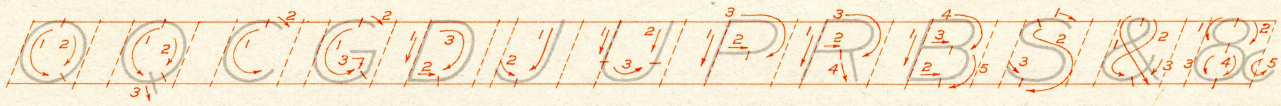
Memory Test.—Cover the page and construct the letters mentally, following the directions given for the memory test of Sheet 1, visualizing the shapes and strokes. Do not leave the page until you can do this without hesitation.

O Q C G D J U P R B S &

FIRST EXERCISE (LEFT TO RIGHT)

SHEET 3

SECOND EXERCISE (TOP TO BOTTOM)



THIRD EXERCISE (LEFT TO RIGHT)

©

Sheet 4. Composition.—This sheet contains the curved letters of Sheet 3 in words selected to give a variety of background areas. Keep these areas approximately equal, so that the words *appear* uniform. Observe closely these combinations and the variations made in the spacing, as you draw the letters. Notice for example that in the first word the spacing of **IG** is closer than **JI,** and that in the word "roof" **OO** is still closer, while in the word "bolt" the **T** and **L** actually overlap.

First Exercise.—Letter each word twice in succession in slope repeat under the copy.

Second Exercise. Word Spacing.—The space between words is made about equal to the height of the letter. Letter the first line across the page and repeat on the second line.

Third Exercise.—Letter the given words, starting at the marks indicated. The slope lines are for direction only. Pencil the words lightly and study the composition carefully by comparing with the copy before brightening. A good way to do this is to mark off on the edge of a strip of paper the location and widths of the letters along the base line in the copy and compare with the words drawn. Do not, however, defeat the purpose of the exercise by measuring before drawing.

Memory Test.—Draw each word mentally, going through the order and direction of the letter strokes, and spacing the letters in your mind.

FIRST EXERCISE

SHEET 4

JIG BOLT COUPLING

SECOND EXERCISE

ROOF TRUSS DETAILS

THIRD EXERCISE

EQUATION

INJECTOR

©

Sheet 5. The Numerals.—It is absolutely necessary that a draftsman be able to make figures neatly, legibly and rapidly. Notice that the shapes of these numbers differ from those used in ordinary figuring just as much as the letters differ from ordinary writing. This sheet gives the analyzed shapes of the numerals.

First Exercise.—Practice the figures in columns, observing the shapes and proportions carefully and noting the starting points of the strokes. The inclined construction box is to be used as in Sheets 1 and 3. The cipher or zero is a slightly narrower ellipse than the "O." **6** and **9** are based on this same elliptical shape. Two forms of **3** are given, the first preferred. In many drafting rooms the second is not allowed as it is easily mistaken for 5. The rule of stability applies to **3** and **8.** Remember the rule of varying curvature.

Second Exercise.—Practice in horizontal lines making four figures after each copy. Watch the proportions of width to height, keeping the figures full-bodied.

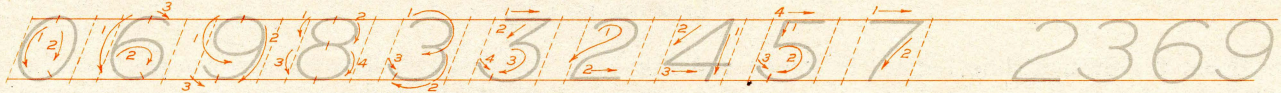
Third Exercise.—This shows the proportionate height of whole numbers and fractions. In dimensioning, fractions are always made with a horizontal line between numerator and denominator, and the figures are two-thirds the height of the whole numbers. Make three after each copy.

Memory Test.—Cover the sheet and visualize the numbers, their shapes and the order and direction of strokes, going through in numerical order from 1 to 10.

The training received by performing these mental drills will be of extreme value in future work. This power of visualization, the order of strokes having become so natural as to require no conscious thought, coupled with the thorough coordination of hand and mind resulting from continued practice will enable one to transfer the mental image to paper skillfully and rapidly. Expert draftsmen have this ability to visualize and coordinate developed to a high degree. It is this power that enables them without apparent effort to make pleasing letters with accuracy and speed.

FIRST EXERCISE (TOP TO BOTTOM)

SHEET 5



SECOND EXERCISE (LEFT TO RIGHT)

THIRD EXERCISE

©

Sheet 6. Straight-line Letters in Pencil and Ink.—This sheet introduces practice with the pen. For making letters of any given height a pen must be selected which will give the desired width without spreading the nibs and make a uniform stroke in all directions. For this sheet use a 516F ball point. Set the pen firmly by pushing it well up into the penholder. Always wet a new pen in ink and wipe it thoroughly to remove the oil film.

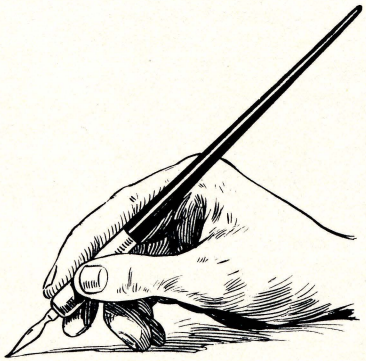


FIG. 3.—HOLDING THE PEN.

A lettering pen well "broken-in" is worth much more than a new one. It should be kept with care and never loaned.

Hold the pen as shown in Fig. 3, and do not change the position of hand or pen in making strokes in different directions, but draw sloping strokes with a finger movement and horizontal strokes with the hand pivoting at the wrist. This is very important both in penciling and inking if you wish to gain the swing and rapidity of professional work.

Ink the pen by dipping it into the bottle, touching it to the neck of the bottle in withdrawing, to allow the surplus ink to run off (some prefer to apply the ink on the under side of the pen with the quill filler). Too much ink on the pen is disastrous to good work. It prevents making clean sharp lines and makes blots at the intersections. Draw with a firm confident stroke but do not press hard enough to spread the nibs. Wipe the pen frequently with a cloth penwiper.

First Exercise. Preliminary Practice.—Make the strokes directly in ink, starting and stopping on the guide lines and keeping them of uniform weight throughout. Ink over and complete the partial strokes of the copy, and maintain the spacing thus begun. The slope guide lines are for direction only.

Second Exercise.—The letters are again to be studied in their group order, arranged according to their related shapes. Make each letter three times in pencil (F) then five times in ink (for M and W make two in pencil and four in ink). The spacing is indicated in color for the first letter. Go over these guide letters and space the rest similarly. Be very careful to remember and use the order and direction of strokes as learned on the previous sheets and in the mental tests.

Third Exercise.—Letter the given words lightly in pencil (2H), before inking. Inclined letters *must* be kept to a *uniform slope.*

FIRST EXERCISE

SHEET 6

SECOND EXERCISE

T T L L

E E F F

H H N N

Z Z X X

A A V V

M M W W

K K Y Y

THIRD EXERCISE

TILE ZENITH MAXIM FILAMENT

©

Sheet 7. The Curved Letters in Pencil and Ink.—This sheet will be a harder test of the control of the pen. The letters are the same size as those of sheet 6 and the same pen, 516 F, should be used. Go through the order and direction of strokes mentally before starting to work, then draw firmly and confidently.

First Exercise.—Practice a row of "O"s directly in ink, inking over the colored guide letters to get the "swing."

Second Exercise.—Take each letter in order, first three times in pencil (F), then five times in ink without penciling. Note that the slope guide lines have nothing to do with the spacing but are only to aid the eye in keeping the letters to a uniform slope.

Third Exercise.—Pencil the line very lightly under the copy, studying the spacing of letters and words, then ink it.

For pencil work to be inked use an H or 2H pencil with a fairly sharp point, being careful not to cut tracks in the paper. In penciling preliminary to inking, the work is not finished and brightened as in studies made in pencil only, but has more or less freedom of rendering while at the same time preserving the form and character of the letter. Do not get the false notion that the inaccuracies of poor penciling may be corrected in inking.

Fourth Exercise.—Pencil the line very lightly, following the copy but without measuring it, using the eraser if necessary until the spacing is satisfactory, then ink.

FIRST EXERCISE

SHEET 7

O Q

SECOND EXERCISE

O O Q Q

C C G G

D D J J

U U P P

R R B B

S S & &

THIRD EXERCISE

SINGLE STROKE CURVED LETTERS

FOURTH EXERCISE

WORD SPACING

©

Sheet 8. The Numerals in Pencil and Ink.—This sheet is for the practice of the numerals, first individually, then in composition. Use the same pen, 516 F, as used on sheets 6 and 7. Go through the order and direction of strokes mentally as learned on sheet 5, before starting to work.

First Exercise.—Make a row of zeros across the page directly in ink. Then make each figure in order, first four times in pencil then six times directly in ink.

Second Exercise. Composition.—In the first line under the copy pencil the numbers from "690" to "554" inclusive observing the spacing carefully. Now ink the first number over the penciling then in the line below ink the same number again without penciling. Proceed across the page inking each number twice, first over the penciled number, then directly, without penciling.

Third Exercise.—Pencil the numbers, observing the copy but not measuring it. When the spacing is satisfactory ink the two lines.

FIRST EXERCISE

SHEET 8

0

6 6 9 9

8 8 3 3

2 2 4 4

5 5 7 7

SECOND EXERCISE

690 832 457 110 776 388 992 554

THIRD EXERCISE

3.1416 3.280833

2.71828 $5\frac{1}{2}$ $6\frac{3}{4}$ $9\frac{7}{8}$

©

Sheet 9. Alphabet and Composition.—This sheet has letters smaller than the preceding and given in alphabetical order instead of in family groups. They are of a size often used in titles. The proportions of the letters and the order and direction of strokes should be so well learned by this time that the making of them will be spontaneous. In making pencil letters work lightly so as not to cut channels in the paper. Keep the slope *uniform.*

First Exercise.—Letter the alphabet twice in pencil, (F).

Second Exercise.—Pencil the first line lightly, (2H), then ink it. Letter the second line directly in ink. Use Hunt 512 pen.

Third Exercise.—Pencil the numerals twice under the first copy. Pencil and ink twice under the second copy. In the remaining space make the line of numerals three times directly in ink.

Fourth Exercise.—Pencil and ink the given title.

Fifth Exercise.—Pencil carefully, then ink. Note that the two lines are to be of equal length.

FIRST EXERCISE

ABCDEFGHIJKLMNOPQRSTUVWXYZ&

SECOND EXERCISE

ABCDEFGHIJKLMNOPQRSTUVWXYZ&

THIRD EXERCISE

1234567890 1234567890

FOURTH EXERCISE

BRIDGE NO. 29 WESTERN DIVISION Q. & Z. RY.

FIFTH EXERCISE

JACK SHAFT FOR
DUPLEX MACHINE

©

Sheet 10. Alphabet and Composition.—Letters of this size are used for captions and smaller titles. In making letters of this size and smaller the strokes are simplified for some of the letters, giving a definite gain in speed and ease of execution. Fig. 4 gives for reference the alphabet as already studied, and under it in smaller size those letters and figures in which the strokes are simplified. Gillott 404 pen is suitable for this sheet.

First Exercise.—Make the first line with 2H pencil, to learn the simplified strokes, then ink it. Follow with two lines directly in ink, using simplified strokes.

Second Exercise.—Letter the given words directly in ink, keeping the spacing like the copy and remembering the new strokes.

Third Exercise.—Pencil the given note, spacing by eye, then ink it.

Fourth Exercise.—Pencil the numbers carefully, then ink. Make three of each after the copy.

Extra Practice.—Use this space if necessary for additional practice in any of the above exercises. Part of it may be used to advantage in practicing your name and other items that occur in the title strip of your mechanical drawings.

Memory Test.—Go through the entire alphabet and numerals mentally, visualizing small-sized letters and drawing them with simplified strokes.

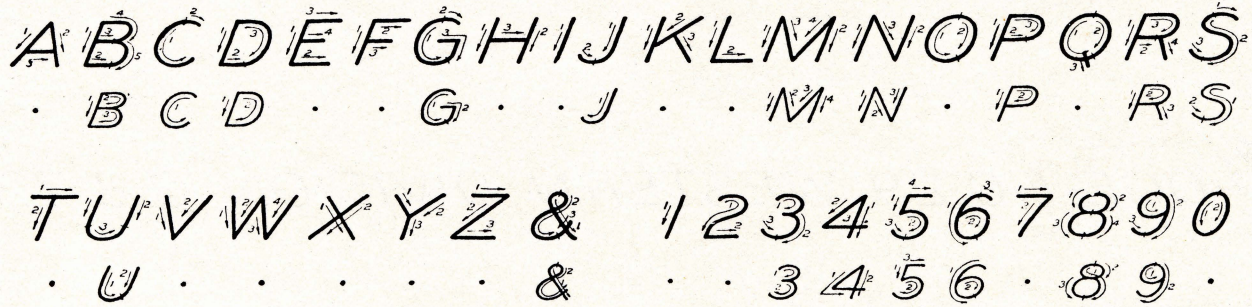


FIG. 4.—REGULAR STROKES AND SIMPLIFIED STROKES.

FIRST EXERCISE

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z & 1 2 3 4 5 6 7 8 9 0

SECOND EXERCISE

PLAN ELEVATION DETAIL ASSEMBLY SECTION A-A

U. S. STD. THREAD CIRCUIT BREAKER C. I. COVER PLATE

THIRD EXERCISE

LONGITUDINAL SECTION
OF PNEUMATIC CAISSON

FOURTH EXERCISE

$1\frac{1}{2}$ $2\frac{3}{4}$ $3\frac{5}{8}$ $4\frac{7}{16}$ $9\frac{11}{32}$

EXTRA PRACTICE

©

Sheet 11. Alphabet and Composition.—Letters of this size are used for notes on drawings and for small captions. Small-sized letters are made more "extended" in their proportion of width to height than are larger letters, in order to increase legibility.

Notice in making smaller letters that the strokes cover the guide lines. It is a mistake to try to keep them entirely inside. Have your work as large as the copy.

Use a Gillott 404 pen and simplified strokes.

First Exercise.—Make two alphabets directly in ink.

Second Exercise.—Letter the given words directly in ink. Keep the letters extended.

Third Exercise.—Pencil the given note keeping the two lines of the same length, then ink it.

In penciling preliminary to inking, a draftsman will not only use the simplified strokes but will still further save time with those letters having horizontal strokes which coincide with the guide lines (*E F L T Z*) by making short cross-marks for the extremities without drawing the strokes at all. Thus for an *L* he would draw stroke 1 and simply mark a point on the guide line for the end of stroke 2.

Fourth Exercise.—Make the numbers directly in ink, three after each copy. Watch the proportion of whole numbers and fractions as no fraction guide lines are provided.

FIRST EXERCISE

ABCDEFGHIJKLMNOPQRSTUVWXYZ& 1234567890

SECOND EXERCISE

TEMPLET EQUALIZER GUARD RAIL FLOOR LINE FIN. ALL OVER

SAFETY VALVE BOTTOM CHORD EXPANSION JOINT SKEW ARCH

THIRD EXERCISE

FORMS FOR THIS SPAN TO
REST ON TIMBER CENTERS.

FOURTH EXERCISE

$1\frac{1}{2}$ $2\frac{3}{4}$ $3\frac{5}{8}$ $4\frac{7}{16}$ $5\frac{9}{32}$ $6\frac{11}{64}$

EXTRA PRACTICE

©

Sheet 12. Single Stroke Lower-case Letters.—In this letter the "waist line" or top of the body letters is usually made two-thirds the height of the capitals, with the "ascenders" (*b, d, f,* etc.) extending up to the "cap line," and the "descenders" (*g, p, q,* etc.) dropping the same distance below the "base line."

On this sheet the letters are arranged in related groups. The first group of eight are straight-line letters.

v, w, x, z are the same as the capitals already studied.

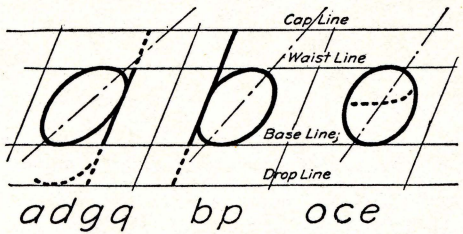


FIG. 5.

Note that the slope guide lines bisect the angles of **v, w,** and **x.**

k, l, t, i are made of straight lines *only.* The top of the **t** is slightly below the cap line and the dots of **i** and **j** are on this "t line."

j, y, f, are straight-line letters with curved terminals which must not be curled up nor made as sharp hooks.

s, o, c, e, are the "all curve" group. **s, o** and **c** are made exactly like the capitals. **e** has the same first stroke as **o** and **c.** Be careful not to turn up its second stroke.

a, d, g, q form another group, in which the curved portion differs from the **o** in having much more inclination. **b** and **p** are closely related to the "**a** family" but the curve has not quite so much slant. Fig. 5 shows in enlarged form this difference in slants and a subtle difference in the shapes of the three curves.

h, n, u, m, r have the curve branching at an angle from the straight stem then turning a sharp curve as shown in Fig. 6. **u** is the same as **n** upside down.

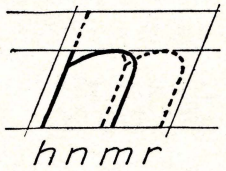


FIG. 6.

First Exercise. Slope Repeat.—Pencil the letters in columns observing the group characteristics.

Second Exercise. Horizontal Repeat.—Pencil four of each letter (three of **m** and **w**).

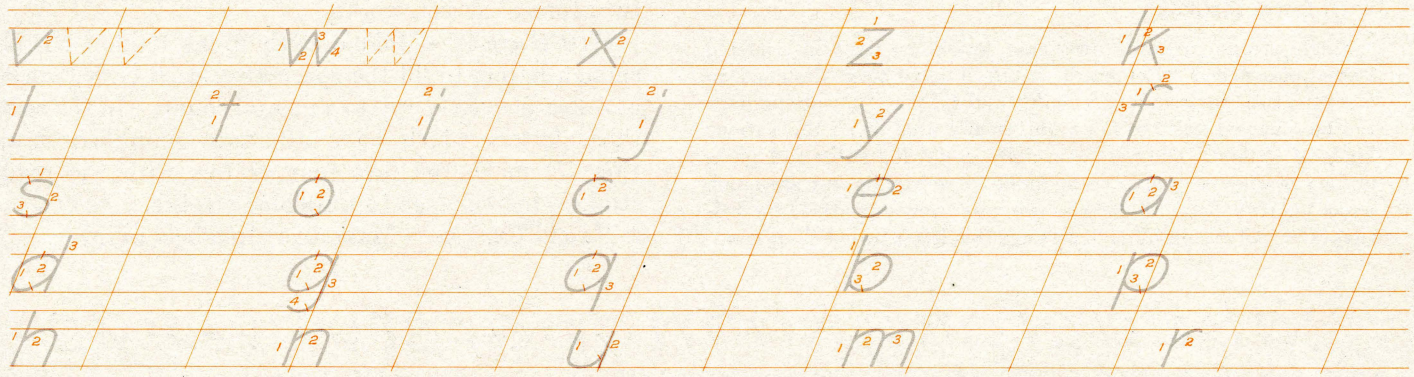
Third Exercise. Composition.—Pencil the given words.

Memory Test.—Cover the sheet and draw the letters mentally in alphabetical order, visualizing the shapes and strokes. Do not leave this page until you can do this without hesitation.

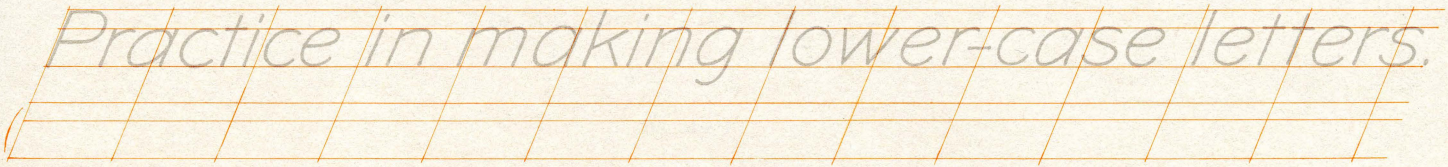
FIRST EXERCISE (TOP TO BOTTOM)

SHEET 12

SECOND EXERCISE (LEFT TO RIGHT)



THIRD EXERCISE



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Sheet 13. Lower-case in Ink.—On the previous sheet the forms of the lower-case letters were studied carefully, and the strokes given are those which would be used in making letters carefully and of comparatively large size. For smaller sizes the strokes for some of the letters are simplified, giving a gain in speed and ease of execution. Fig. 7 shows the alphabet as studied and under it the letters which in ordinary work are made with fewer strokes.

Single stroke inclined lower-case letters as used in drafting (sometimes called "Reinhardt letters") have been designed to meet the two requirements, *legibility* and *speed*. They are perhaps the best known and the most universally used of all the various kinds of letters. They are especially useful for notes and paragraphs as they not only can be made more rapidly but are much easier to read than all caps as we read words by their "word-shapes." All classes of engineers use this letter rather than hand-writing for taking notes both in the shop and in the field; it is the common and accepted standard in all structural steel drafting rooms; it is used in mapping to designate water features; architects are using it for explanatory notes on drawings, in fact wherever the graphical language of drawing is supplemented by written language it finds a place.

Practice for speed by swinging the strokes at an even cadence, counting mentally "one, two, three; one, two, three," as you work.

First Exercise.—Make directly in ink (Gillott 404 pen) enough letters to fill the space after each copy, working at a steady even speed, to a mental count. In the case of those letters which have alternate simplified strokes (Fig. 7) make the first four or five with the regular strokes, then change to simplified strokes.

Second Exercise.—Make two alphabets in ink.

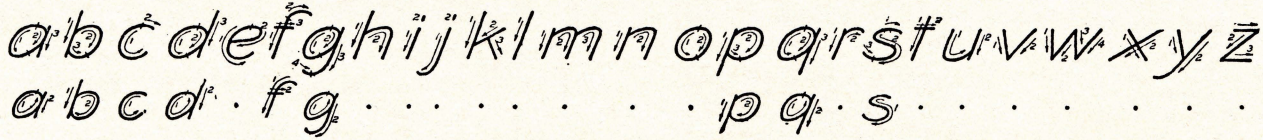


FIG. 7.—REGULAR STROKES AND SIMPLIFIED STROKES.

FIRST EXERCISE

SHEET 13

a a a b c

d e f

g h i

j k l

m n o

p q r

s t u

v w x

y z a

SECOND EXERCISE

abcdefghijklmnopqrstuvwxyz

EXTRA PRACTICE

Sheet 14. Composition.—The secret of good composition lies in keeping the letters *close together* and to a *uniform slope*. Have them full-bodied and of even height.

In making lower-case letters have the strokes cover the guide lines. A common fault among beginners is to cramp the letters by staying inside the guide lines. See to it that your work is as large as the copy.

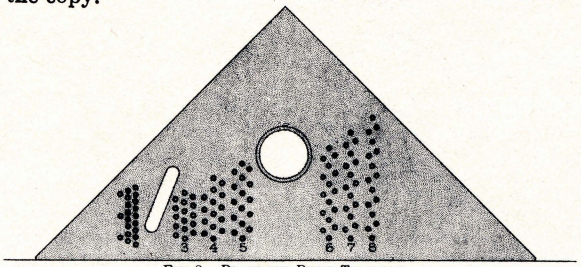


FIG. 8.—BRADDOCK-ROWE TRIANGLE.

First Exercise.—In the first space under the copy pencil and ink the given words, then repeat directly in ink in the second space. Use Gillott 404 pen.

Second Exercise.—Pencil and ink the given note. The appearance of a note or paragraph of several lines is much improved if the right-hand edge as well as the left-hand edge is kept straight.

In making lower-case letters guide lines are always drawn for cap line, waist line and base line. The drop line is not drawn.

There are two convenient and time-saving devices for spacing and drawing horizontal ruling for lines of letters, the "Braddock triangle,"[1] Fig. 8 and the "Ames lettering instrument,"[2] Fig. 9.

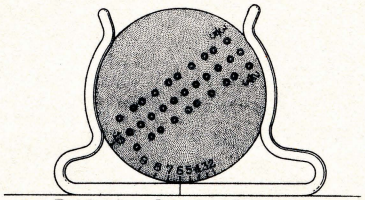


FIG. 9.—AMES LETTERING INSTRUMENT.

In each of these a sharp pencil is inserted in the countersunk holes and the instrument drawn back and forth by the pencil while guided by a T square blade. One of these should be in every draftsman's outfit. The spacing on this sheet is equal to No. 5 of either instrument, that on sheet 13 is No. 6, and on sheet 15 is No. 4.

[1] Made by the Braddock Instrument Co. Swissvale, Pa.
[2] Made by O. A. Olson Mfg. Co. Ames, Iowa.

FIRST EXERCISE

Angle Channel Drop-forging Full Size Keyway 2 Req'd.

Bore Ream Countersink Chamfer Harden & Grind Broach

Drill and tap for special bushing Std. Ogee Cast Washer

SECOND EXERCISE

Note - Allowable variation on dimensions locating finished surfaces is plus or minus .005.

EXTRA PRACTICE

©

Sheet 15. A Paragraph in Lower-case.—This sheet further illustrates the composition and spacing of words and lines.

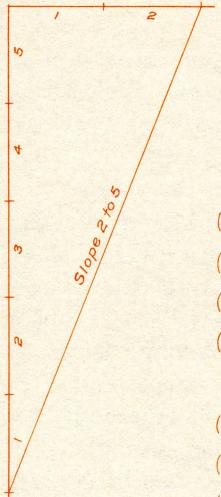
For the effective appearance of inclined letters the important feature is to keep the slope uniform. To do this it is necessary to draw slope guide lines to aid the eye. In the previous sheets these have been given in colored ink. On this and following sheets they are to be put in, as they would have to be in doing any finished lettering work. The slope used in this book is 2 to 5 or about 68 degrees, and may be made by laying off two units on a horizontal line and five on a vertical line as shown in the upper corner of this sheet. Fit to this line a triangle held against a straight-edge and draw parallel lines lightly across the space to be lettered, erasing them when the work is finished. A more convenient way to put in guide lines is with the slope triangle (The usual commercial one sold is made to 67½ degrees), or with the Ames instrument.

First Exercise.—With a triangle against a straight-edge draw a series of slope guide lines very lightly across the sheet, not over a half-inch apart. Letter the paragraph lightly with 2H pencil, noticing that the letters are slightly extended, then ink it with Gillott 303 or other suitable pen.

As previously stated, a pen broken-in by use is better than a new one. A new pen may be given something of the characteristics of an old one by holding it in a match flame for two or three seconds and wiping it carefully.

Second Exercise.—Repeat the paragraph in pencil and ink, striving to improve on the first exercise.

In erasing pencil marks left from preliminary penciling and guide-lining use a soft eraser or art gum, holding the page down firmly and rubbing from left to right to prevent buckling the paper. Careless, violent erasing is not only liable to break the paper but it takes the brightness and life out of the ink lines.



Good lettering is essential to good drafting. An otherwise well-executed drawing may be ruined not only in appearance but in usefulness by lettering done ignorantly or carelessly.

FIRST EXERCISE

SECOND EXERCISE

EXTRA PRACTICE

©

Sheet 16. Dimensions and Symbols.—A draftsman must be able to put in dimensions neatly and rapidly.

Thus far in this book all the work has been done on horizontal guide lines and in working you have had the book on the table in one position, either parallel to the bottom edge or perhaps for more comfort turned at an angle. In the following sheets will be found examples of dimensioning and lettering as applied on drawings, in which in some cases letters and figures run in other than horizontal direction. To get the full value of the practice on these sheets, since commercial drawings are always fastened to the drawing board, do not turn the book but keep it approximately parallel to the table edge and shift the arm and body. Thus in putting in vertical dimensions turn the body so that the right side is against the table.

First Exercise.—This gives in enlarged form the shape of the arrow head used in dimensioning. Pencil three after each copy observing the shape carefully.

Second Exercise.—Make arrow heads as indicated directly in ink. For the vertical and inclined lines shift your body into the position required for drawing a letter or figure on the line, as shown in the diagram Fig. 10, and draw the arrow heads, following the strokes given. The figure shows also an alternate method of stroking preferred by many draftsmen.

Third Exercise.—Make arrow heads and dimensions directly in ink. Always make the arrow heads for a dimension before making the figures.

Fourth Exercise.—Symbols for *finish, at, asterisk, center line, feet and inches, degrees, minutes and seconds, per cent, square root, dollars and cents, number, pounds,* and *ratio.*

Fifth Exercise.—Dimension the given drawing.

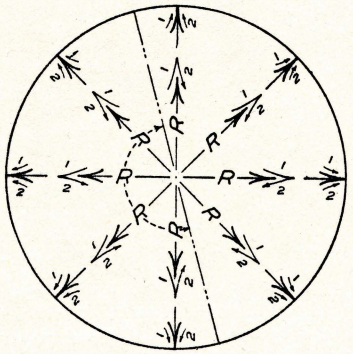


FIG. 10.

Sheet 17. A Working Drawing.—This sheet, representing the lower right hand corner of a shop drawing, is to be dimensioned, and the notes and title added, so that when completed it will be as nearly as possible like the copy on the opposite page.

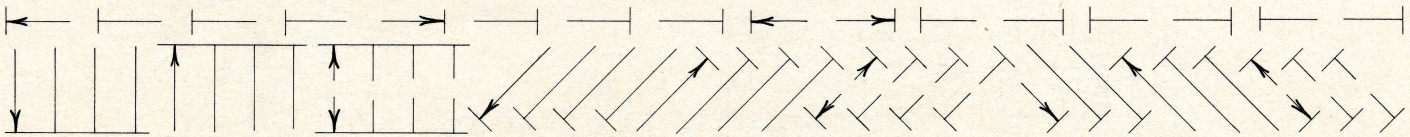
Horizontal guide lines for lettering and dimensions are given. Put in slope guide lines with your triangle as on sheet 15 for the notes and title. Dimensions should be made if possible without the aid of slope guide lines. In fact most professional draftsmen put in dimensions without even horizontal guide lines.

Letter your own initials in spaces "drawn by" and "traced by." Have it "checked by" instructor and give the "date" of completion of the sheet.

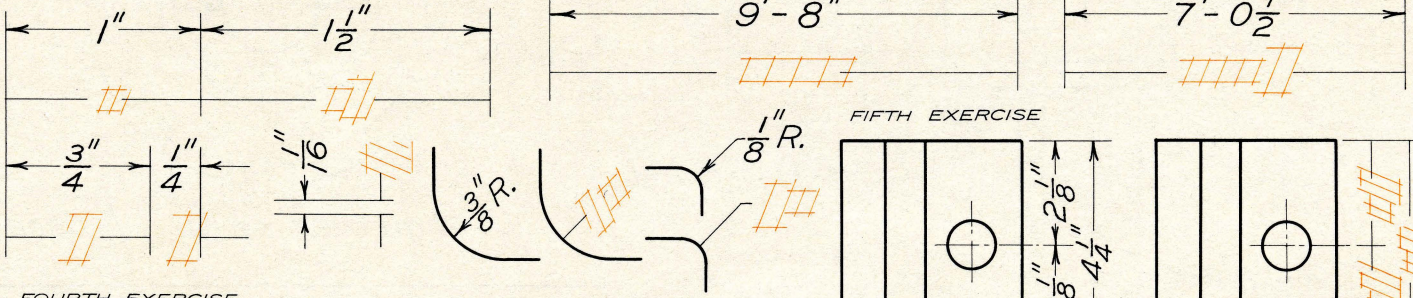
FIRST EXERCISE

SHEET 16

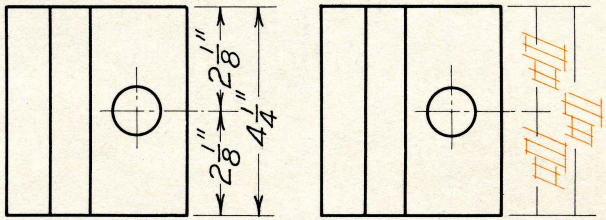
SECOND EXERCISE



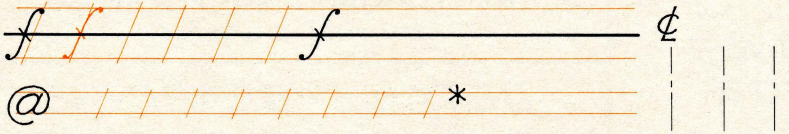
THIRD EXERCISE



FIFTH EXERCISE

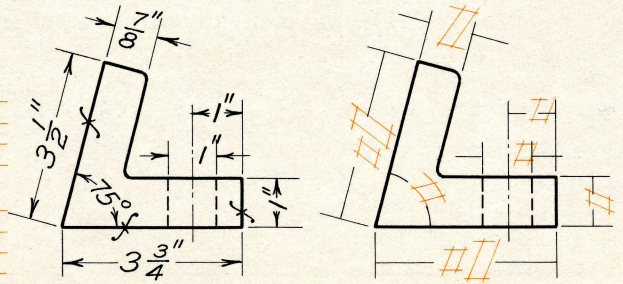


FOURTH EXERCISE



2"x 4"x 8'-6" 49°-17'-16" 23% √25 $ ¢

#10 9"-35# I-BEAM 1:2:4 CONCRETE



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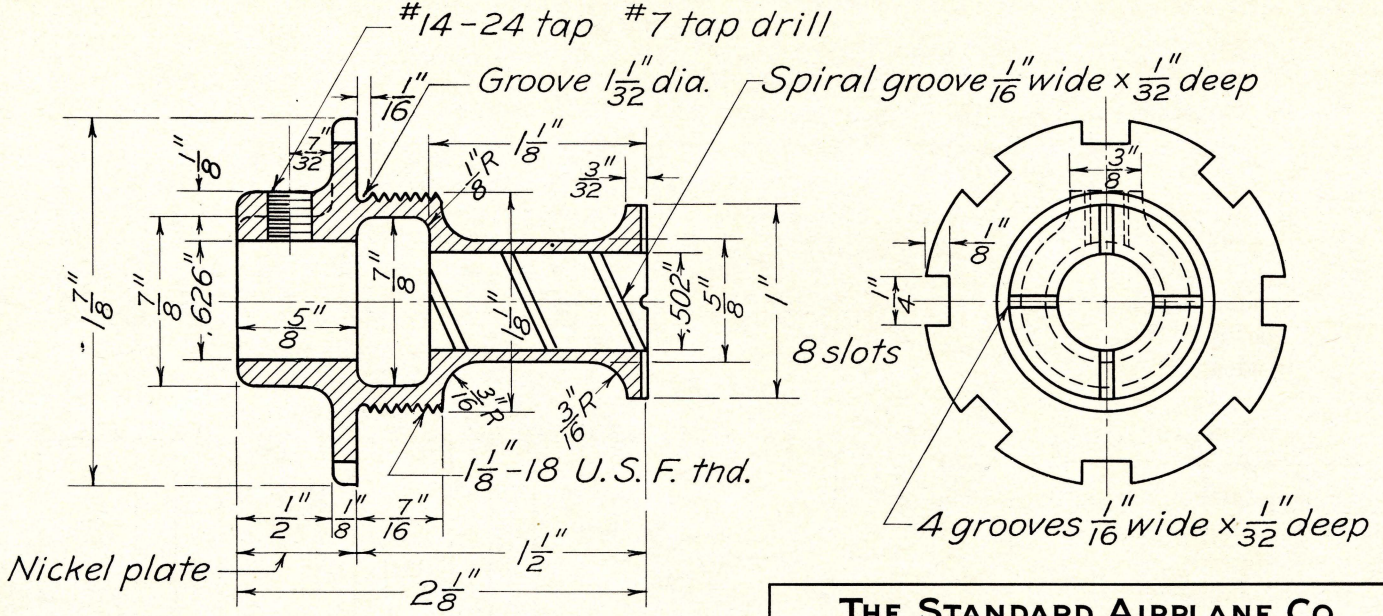

S-6 231 ADAPTER BEARING
PHOSPHOR BRONZE 1 REQ'D.

LIMITS
Bore +.001 −.000
Length +.000 −.002

THE STANDARD AIRPLANE CO.
DAYTON, OHIO, U.S.A.

DETAILS-BEARINGS S-6 150 HP. ENGINE

CHANGES			
Drawn by ..... A.B.C.		Date ..... JAN. 2, 1930	
Traced by ..... A.B.C.		Scale ..... FULL SIZE	
Checked by ..... D.E.F.		D'w'g. No. C-782	

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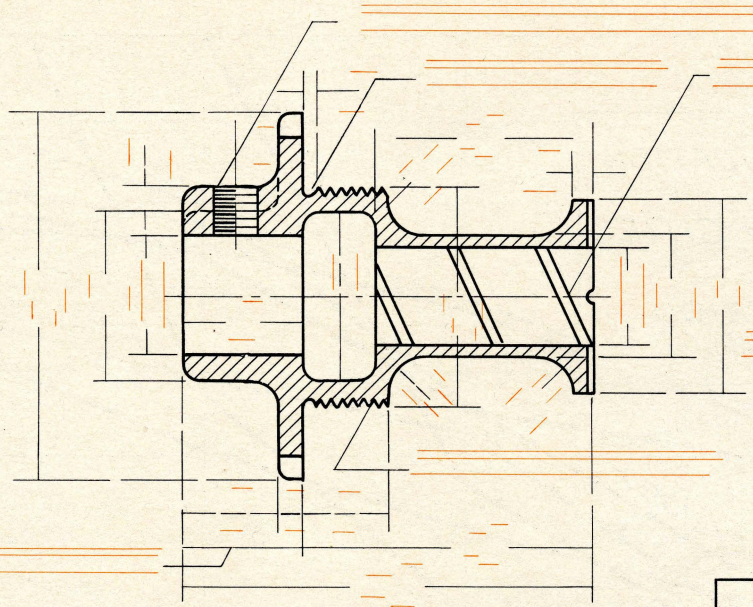

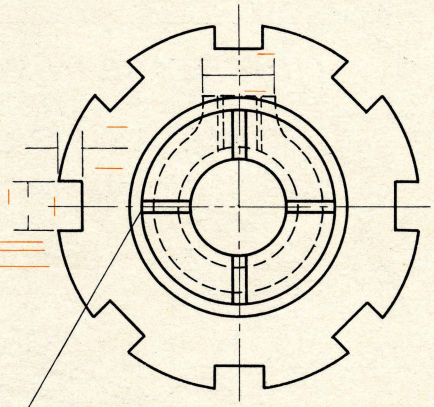

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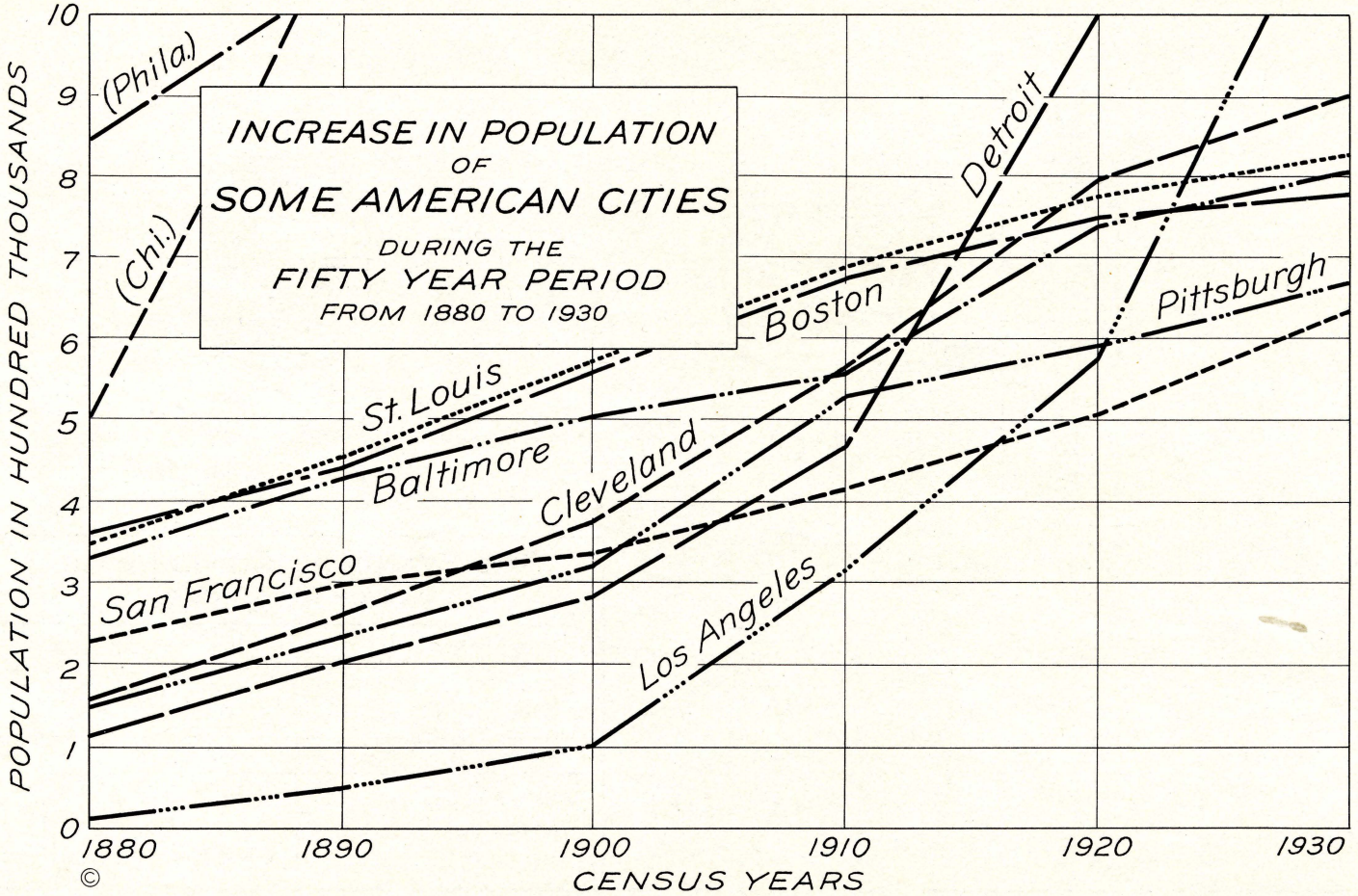
INCREASE IN POPULATION
OF
SOME AMERICAN CITIES
DURING THE
FIFTY YEAR PERIOD
FROM 1880 TO 1930
POPULATION IN HUNDRED THOUSANDS
CENSUS YEARS
0
1
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1880
1890
1900
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(Chi.)
Detroit
Boston
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Baltimore
Cleveland
San Francisco
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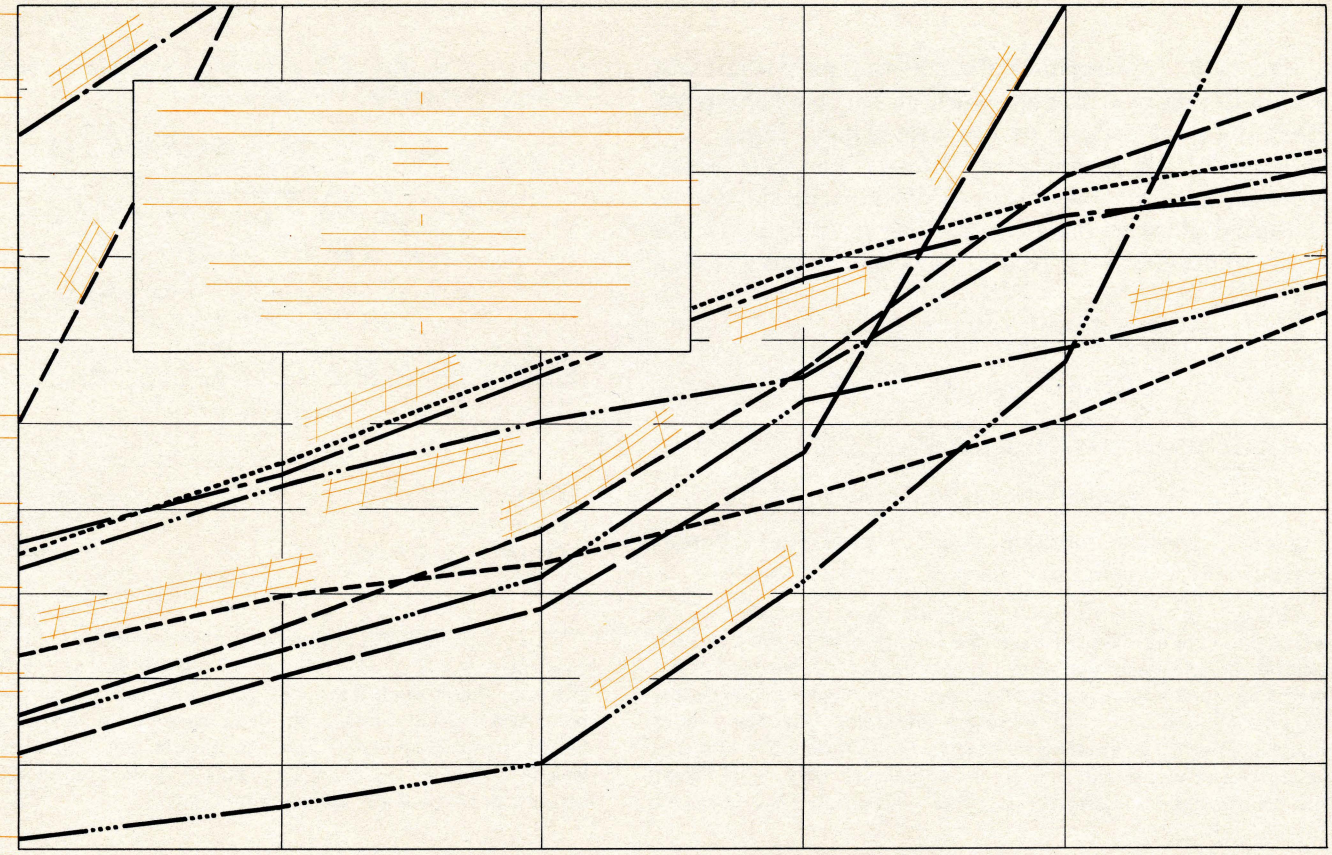

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Sheet 18. A Graphical Chart.—Complete the chart with lettering and title as shown on the left-hand page. Keep the slant uniform by using slope guide lines.

Sheet 19. A Symmetrical Title.—This sheet represents the lower right-hand corner of a structural drawing, the usual place for titles in working drawings. In the given ruling draw the title as shown in reduced size in

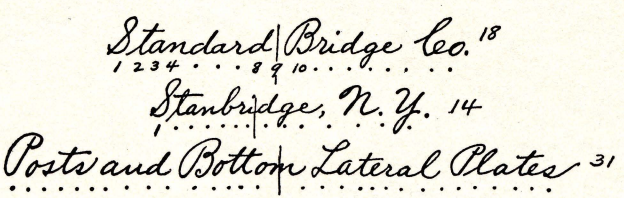


FIG. 11.—PRELIMINARY STUDY.

Fig. 12, choosing suitable pens to give the different gradations of weights and sizes of letters.

This type of title is balanced on a center line. To balance lines lettered in capitals first write out the arrangement of the title on a separate piece of paper (or better, typewrite it). Count the letters, including word spaces, and make a mark across the middle letter or space of each line. Fig. 11 shows three lines from the title of Fig. 12. Begin the drawing by placing the middle letter or space on the center line of the title layout and sketch very lightly from this to the right, making the last half of the line first. Lay off the length of the right half on the other side and sketch that side, working either forward or backward.

STANDARD BRIDGE CO.
STANBRIDGE, N.Y.

Bridge No. 3 over Deer Creek
M. & W. Ry. Eastern Div.

Span No. 2 Double Track Through
260'-8" c. to c. End Pins

POSTS AND BOTTOM LATERAL PLATES

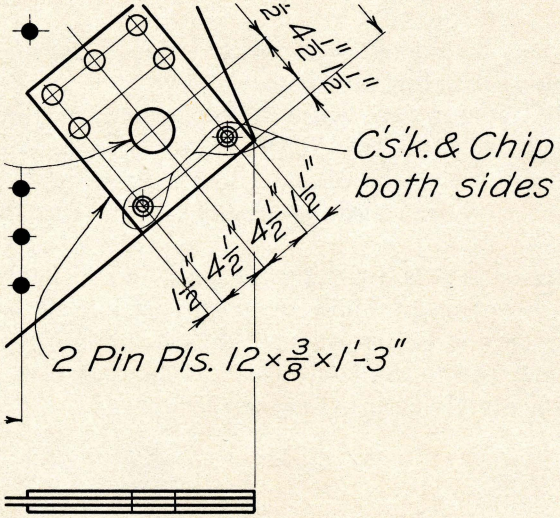
Scale: $\frac{3}{4}$" = 1'-0"

In charge of J. M. Talbott

Drawn by C.P.R. 11-7-23 Revised 12-5-23
Checked by A.T. 11-9-23 Revised 1-4-24
Order No. 2906 Sheet No. 12

FIG. 12.—FINISHED TITLE.

This counting method does not apply so well to lines of lowercase on account of the number of narrow letters. It is better either to sketch such lines lightly in place, estimating the starting point and shifting if necessary; or to sketch each line in the correct height on another sheet, find the middle point and transfer the length of line to the drawing. This may be done also with the capitals in place of the counting method.



'tom Lateral Pls.

NOTE:
Material – Medium O. H. Steel
Shop Rivets – Rivet Steel ⅞" Diam.
Field Rivets – Wrought Iron

STANDARD BRIDGE CO.

r 21, 1930.

on

nief Engineer

©

Sheet 20. A Reference Page.—This sheet illustrates variations of the Inclined Commercial Gothic letter. **"Light face"** is a term used in designating letters whose strokes are correspondingly thinner for a given height than ordinary letters. When the strokes are very thin they are called hair-line letters. **"Bold face"** or "black face" letters are heavier than ordinary letters. They are built up of two or more strokes with ordinary pens, or may be made more rapidly in single stroke with special lettering pens. Fig. 13 illustrates four different kinds of lettering pens, the Barch-Payzant the Speedball, the Perfection and the Shepard. These are made in graded sizes and may be ordered either singly or in sets through any dealer in drawing instruments.

Extended letters are wider in proportion to their height than normal letters. Those shown have the construction box as used on Sheets 1 and 3 extended to a parallelogram whose length is one-third more than the rhombus.

Compressed letters are narrower than normal letters in their proportion of width to height. Those shown are based on the compression of the rhombus into a parallelogram of two-thirds the width. This form is used where economy of space is necessary.

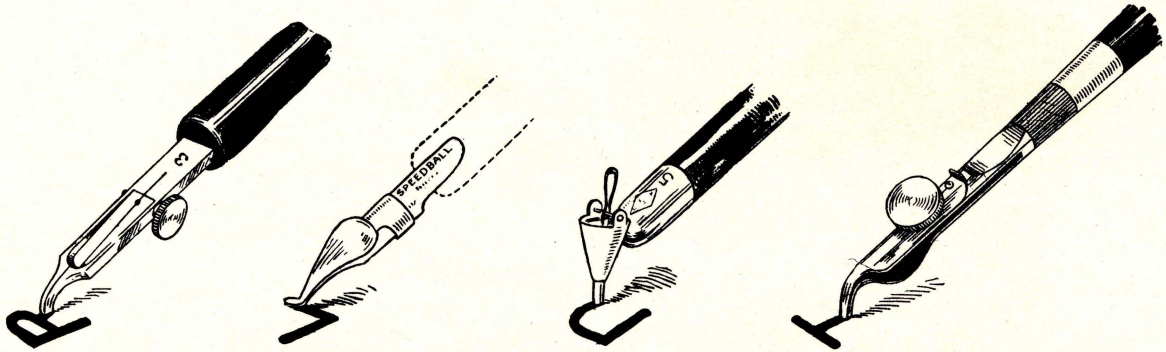


FIG. 13.—BARCH-PAYZANT PEN, SPEEDBALL PEN, PERFECTION PEN AND SHEPARD PEN.

ABCDEFGHIJKLMNOPQRSTUVWXYZ&
1234567890 aabcdefgghijklmnopqrstuvwxyz
Light Face

ABCDEFGHIJKLMNOPQRSTUVWXYZ&
1234567890 aabcdefgghijklmnopqrstuvwxyz
Bold Face

ABCDEFGHIJKLMNOPQRSTUV
WXYZ& 1234567890 aabcdefgghij
klmnopqrstuvwxyz Extended Form

ABCDEFGHIJKLMNOPQRSTUVWXYZ&& 12334567890
aabcdefgghijklmnopqrstuvwxyz Single Stroke Compressed

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